UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,142	08/28/2001	Jeffrey Meng Wah Chan	004-2628-1	7123

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EXAMINER
HARKNESS, CHARLES A

ART UNIT	PAPER NUMBER
2183	8

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _27 February 2004_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _21-55_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _21-55_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   In view of Applicant's amendment to the title, the previous objection has been

withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 21-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Barlow U.S.

Patent Number 5,168,564 (herein referred to as Barlow).

3.   Referring to claims 21, 32, and 45 Barlow has taught a method comprising; locking a

resource to be accessed by an executable computer instruction, wherein locking the resource

includes locking the resource prior to completing a determination of hazards related to the access

(Barlow column 1 lines 50-61, column 2 lines 40-64; the lock indicator, or mechanism can be

canceled after it is set once it is determined that the command using the resource that is locked is

invalid, therefore the resource is being locked before the command has been determined to have

hazards, and before the command is known to go until completion, which goes along with the

definition of prior to a determination of a hazard in the instant application at page 2 line 23-page

3 line 4).

4.   Referring to claims 22, 34, and 46 Barlow has taught wherein locking the resource

includes locking the resource prior to the executable computer instruction entering a trap stage of

an instruction pipeline (Barlow column 7 line 60-column 8 line 3, figure 4a, column 5 lines 9-18;

the fault, which is the same thing as a trap, or exception, causes the cancel command, but this is

after the lock has already occurred, and must be cancelled).

5.   Referring to claims 23, 35 and 47 Barlow has taught wherein the executable computer

instruction is an atomic instruction including a portion to lock the resource and a portion to

unlock the resource (Barlow column 1 lines 50-61; the resource is locked at the read portion and

reset after the write portion of the operation).

6.   Referring to claims 24, 36, and 48 Barlow has taught wherein determination of a hazard

includes determining whether a read-after-write hazard exists (Barlow column 1 lines 43-61; the

resource is locked at the read portion and reset at the write portion of the operation).

7.   Referring to claims 25, 37, and 49 Barlow has taught wherein locking the resource

includes: locking the resource during an effective address calculation stage of an instruction

pipeline (Barlow column 4 lines 35-51, column 5 lines 9-19).

8.   Referring to claims 26, 38, and 50 Barlow has taught wherein locking a resource includes

locking at least a portion of a cache (Barlow column 5 lines 26-40, column 9 line 53-column 10

line 16).

9.   Referring to claims 27, 39, and 51 Barlow has taught wherein locking a resource includes

locking at least one memory address (Barlow column 5 lines 26-40, column 9 line 53-column 10

line 16; every entry in the cache is a memory address).

10.   Referring to claims 28, 40, and 52 Barlow has taught further comprising unlocking the

resource no later than a time at which the executable computer instruction exits an instruction

pipeline, regardless of whether the executable computer instruction is cancelled (Barlow column

1 lines 50-61; the resource is locked at the read portion and reset after the write portion of the

operation – after the write portion of the operation, the process is complete and therefore leave the pipeline).

11.   Referring to claims 29 and 53 Barlow has taught wherein unlocking the resource includes:

unlocking the resource in the normal course of executing the computer instruction (Barlow column 1 lines 50-61; the resource is locked at the read portion and reset after the write portion of the operation – after the write portion of the operation, the process is complete and therefore leave the pipeline).

12.   Referring to claims 30, 41, and 54 Barlow has taught wherein unlocking the resource includes preventing a write portion of the executable computer instruction from altering information held in at least a portion of the resource (Barlow column 2 lines 40-64 – the other resources are not affected).

13.   Referring to claims 31 and 55 Barlow has taught wherein preventing a write portion from altering information includes suppressing writing a value to an architectural storage location (Barlow column 2 lines 40-64; since the operation is being canceled, there will be no write-back to the registers).

14.   Referring to claim 33 Barlow has taught further comprising a plurality of processing cores, wherein respective processing cores are adapted to lock the resource in response to access by respective executable computer instructions prior to completing respective hazard determinations (Barlow column 9 lines 3-26; multiple cores have access to the same resource).

15.   Referring to claim 42 Barlow has taught a processor adapted to speculatively dispatch a load operation to a cache unit prior to determining whether read-after-write hazards associated

with the load operation are present (Barlow column 1 lines 50-61, column 2 lines 40-64; the lock indicator, or mechanism can be canceled after it is set once it is determined that the command using the resource that is locked is invalid, therefore the resource is being locked before the command has been determined to have hazards, and before the command is known to go until completion, which goes along with the definition of prior to a determination of a hazard in the instant application at page 2 line 23-page 3 line 4 – the first portion of a read modify write is a read from memory, which is the same as a load type instruction).

16.   Referring to claim 43 Barlow has taught the processor of claim 42 wherein the processor is adapted to lock a resource associated with the load operation concurrently with dispatching the load operation (Barlow column 1 lines 50-61, column 2 lines 40-64; the lock indicator, or mechanism can be canceled after it is set once it is determined that the command using the resource that is locked is invalid, therefore the resource is being locked before the command has been determined to have hazards, and before the command is known to go until completion, which goes along with the definition of prior to a determination of a hazard in the instant application at page 2 line 23-page 3 line 4 – the first portion of a read modify write is a read from memory, which is the same as a load type instruction – the resource is locked during the read portion).

17.   Referring to claim 44 Barlow has taught the processor of claim 43 wherein the processor is further adapted to unlock the resource associated with the load operation no later than a time at which an instruction implementing the load operation exits an instruction pipeline, regardless of whether the instruction is cancelled before exiting the instruction pipeline (Barlow column 1 lines 50-61; the resource is locked at the read portion and reset after the write portion of the

operation – after the write portion of the operation, the process is complete and therefore leave

the pipeline).

Response to Arguments

18.   Applicant's arguments with respect to claims have been considered but are moot in view

of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Charles A Harkness whose telephone number is 703-305-7579.
The examiner can normally be reached on 8:00 A.M. – 5:30 P.M. with every other Friday off.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Eddie Chan can be reached on 703-305-9712. The fax phone numbers for the
organization where this application or proceeding is assigned are 703-746-7239 for regular
communications and 703-746-7238 for After Final communications.
Any inquiry of a general nature or relating to the status of this application or proceeding
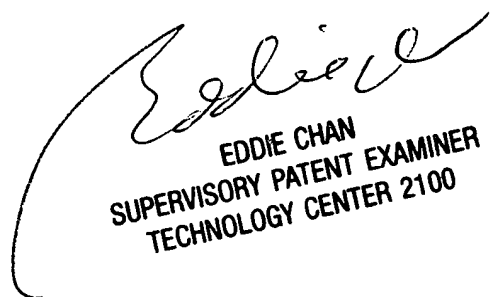should be directed to the receptionist whose telephone number is 703-305-7579.

Charles Allen Harkness

Patent Examiner

Art Unit 2183

May 15, 2004

EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100